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SECTOR REFORM AND UTILITY COMMERCIALIZATION (SRUC)

Background Report on Namibia's Power Sector: Utility Performance & Loss Reduction

July 2015

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SECTOR REFORM AND UTILITY COMMERCIALIZATION (SRUC) PROJECT

BACKGROUND REPORT ON NAMIBIA'S POWER SECTOR: UTILITY PERFORMANCE & LOSS REDUCTION

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SECTOR REFORM AND UTILITY COMMERCIALIZATION
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INTRODUCTION

USAID's **Sector Reform and Utility Commercialization Program (SRUC)** aims to enhance the financial viability and long term sustainability of developing countries' electricity systems, thereby enabling their expansion and establishing the necessary preconditions for clean energy investments.

USAID wishes to use the SRUC Task Order to provide support to the power sectors of Zambia, Mozambique and/or Namibia. In August 2015, USAID and SRUC advisors will carry out a scoping mission to each of the three countries to gain a more complete understanding of the current state of their respective electricity sectors. This scoping trip will provide information that can be used to design an effective SRUC technical assistance program that will reduce system losses and/or facilitate IPP program design and implementation.

This *Background Report* has been written to provide USAID and the SRUC team with easily accessible information prior to their departure on the scoping trip. The document provides insights into the Namibian power sector, focusing on recent and current efforts to improve utility performance and reduce losses. The Report is structured as follows:

- (a) Background information on the operations of the power sector, including any relevant information on technical and commercial losses, loss reduction analyses and strategies, previous approaches to slum and rural electrification and current thinking on best practices and areas of improvement in loss reduction activities.
- (b) To the extent desk research has allowed, detailed information on key performance indicators such as estimates for electricity access rates, technical and non-technical losses, collection rates and subsidies.
- (c) A review of other international donors' work in loss reduction in order to explore potential areas of collaboration, and reduce potential overlap.

Before this, we provide a little information on Namibia's economic profile.

BACKGROUND

Economy & Population

Namibia is a middle-income (\$9,490 GNI per capita in PPP dollar in 2013)¹, mid-sized economy (2.2M people in 2014).² The largest contributor to the country's GDP is the services industry, specifically the tourism industry and the recent expansion in government services in health and education. Historically, the mining industry, specifically centered on diamond mining as well as uranium extraction, drove the economy. In 1978, nearly 47% of Namibia's GDP came from this industry, but it had decreased to around 11% by 2012.³ Namibia has achieved high urban electrification rates estimated at around 98%, although the present grid network reaches a far smaller percentage of the rural population, estimated at around 30-40%.⁴ Towns

are the most populated areas of Namibia (particularly those of the north), especially within informal settlements and established apartment blocks. In these areas, densities are typically above 50,000 people per square kilometer, equivalent to each person occupying an area of less than 20 square meters. In contrast, there is one person per 20 million square meters in some areas of Namibia (Figure 1). This trend is expected to continue as rural residents have been moving to towns to seek regular income and better social services. The country's urban population has grown annually at between 4-5% over the past few decades, while rural populations have only grown at between 1-2% per year in most areas.

The Namibian economy grew at around 5% per year between 2010 and 2013.⁵ With the demands for increased urbanization, the energy intensive mining sector, and the limited increase in domestic electricity generation capacity, Namibia is reliant on South Africa for nearly 60% of its electricity. Between 2002 and 2011, electricity demand grew at a compound annual growth rate of approximately 6% per year, while domestic generation has remained largely flat. The vast majority of demand is accounted for by the cities, where the largest portion of citizens with access to electricity live.⁶

The Electricity Sector: Key Participants & Structure

Key Participants

Namibia's Ministry of Mines & Energy (MME) regulates minerals and energy resources, as well as manages mining, petroleum and geothermal industries. The MME is in charge of collecting royalties, and ensuring that safety, health and environmental standards are

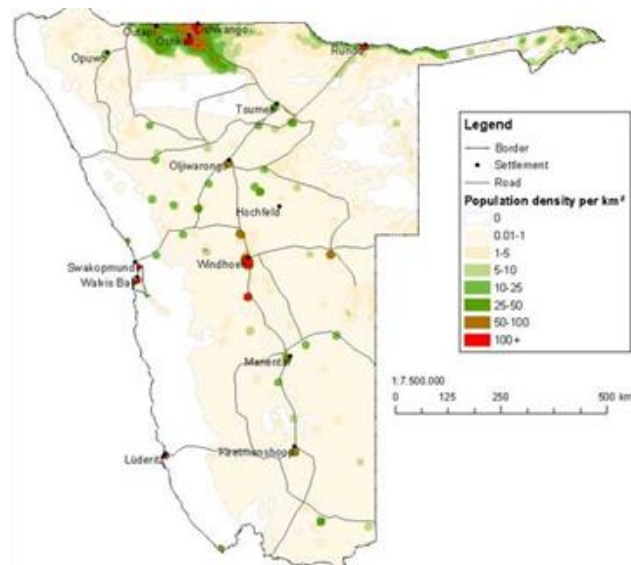


Figure 1: Population Density of Namibia
Source: University of Cologne

¹ <http://data.worldbank.org/data-catalog/GNI-per-capita-Atlas-and-PPP-table>

² <https://www.cia.gov/library/publications/the-world-factbook/rankorder/2119rank.html#wa>

³ http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/2014-2018_-_Namibia_Country_Strategy_Paper.pdf

⁴ <http://www.naruc.org/international/Documents/NAMIBIA%20Case%20Study.pdf>

⁵ International Monetary Fund, World Economic Outlook Database, October 2014

⁶ <http://databank.worldbank.org/data/views/reports/tableview.aspx>

consistent with the relevant State and Commonwealth legislation, regulations and policies.⁷ Within the Ministry, the Energy Directorate is responsible for the enforcement of the White Paper on Energy Policy of 1998, a document established by the MME with the aim to achieve security of energy supply, social betterment, effective governance, investment and growth, economic competitiveness, economic efficiency and sustainability. The Directorate is broken into three divisions: (1) Electricity, (2) Renewable Energy, and (3) National Energy Fund. The Electricity division is in charge of restructuring the regulatory authority⁸, the Electricity Control Board (ECB).

ECB is a legal regulatory authority established through the creation of the Electricity Act of 2000, which was replaced by the Electricity Act of 2007. The Electricity Act expanded the ECB's regulatory mandate and core responsibilities. The ECB is responsible for regulating the electricity supply industry, including electricity generation, transmission, distribution, supply, and import and export, through setting tariffs and issuance of licenses.

NamPower is the state-owned and vertically integrated electricity generator, trader, and transmission entity. The company owns and operates the majority of all Namibia's transmission and generation assets, as well as some distribution facilities. In addition to generation, the company also owns shares in the regional electricity distributors.

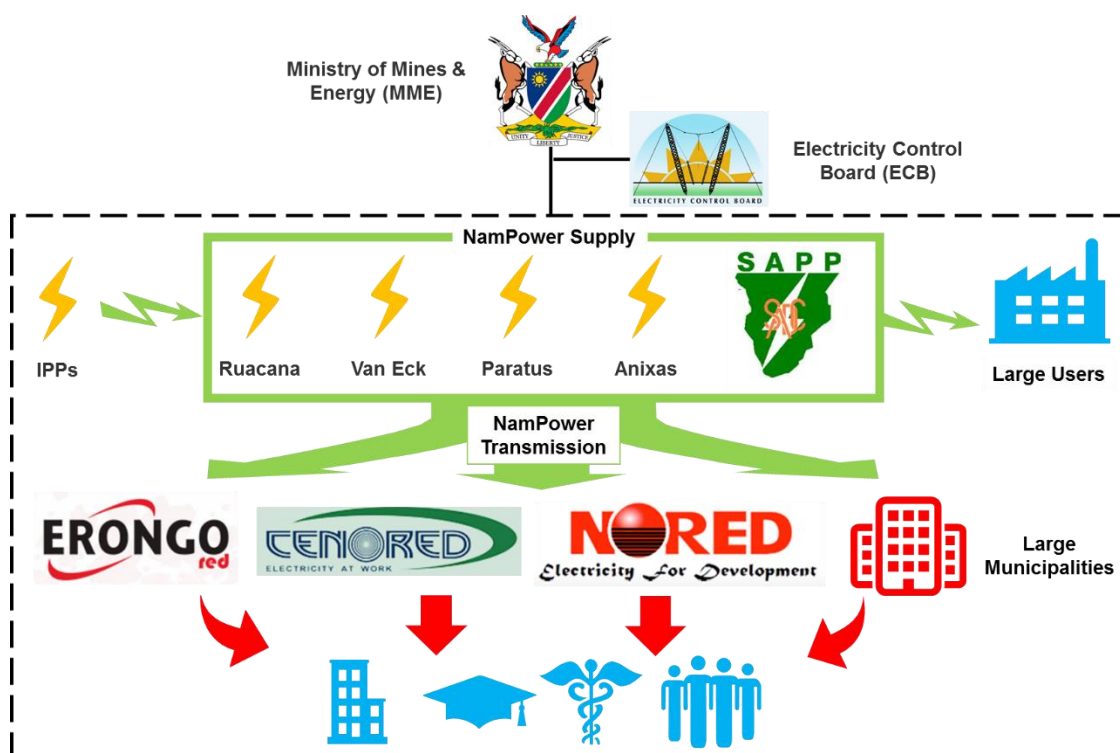


Figure 3: Diagram of Electricity Sector Structure in Namibia

Electricity Industry Structure

The generation and trading of electricity in Namibia are fully managed by NamPower, as the single buyer. All independent power producers (IPP) that would like to sell electricity into the grid have to do so through NamPower under a power purchase agreement (PPA).

Name	Size (MW)	Type	Status
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⁷ <http://www.mme.gov.na/about-us/>

⁸ <http://www.mme.gov.na/directorates/energies/>

Ruacana Hydropower Station	330	Hydro	Operating, Owned by NamPower
Van Eck	120	Coal	Operating 1/4 Capacity, Owned by NamPower
Paratus	17	Diesel	Operating, Owned by NamPower
Anixas	22.5	Diesel	Operating, Owned by NamPower

Table 1: NamPower's Major Generation Assets

The Ruacana Hydropower station is the largest generation asset in the Namibian power supply system, producing 99% of the electricity generated domestically in the 2013-2014 period.^{9 10} A fourth unit has been recently commissioned increasing its capacity from 240 MW to 330 MW. However, Ruacana is a run-of-river plant and the variations in Southern Angola's rainfall limit its performance. It is therefore operated as a base load plant during the rainy season (February to May) and for peak load the rest of the year.

In 1973, Van Eck, a 120 MW coal-fired electricity generation plant, was commissioned. Largely inefficient generation and complicated maintenance make running the Van Eck plant impractical. These constraints have resulted in a rehabilitation project for the plant during FY 2014, which has successfully brought one boiler back online generating 30 MW.¹¹ Increasing the complications with the plant's operations, the coal necessary to run Van Eck is not produced domestically but imported, resulting in more costly generation. The diesel fired Paratus (17 MW) and Anixas (22.5 MW) power plants complete NamPower's portfolio, the latter having been commissioned fairly recently in November 2011.¹² Anixas generated the remaining 1% of power not produced by the Ruacana plant during the 2013-2014 period.¹³

In terms of renewable energy (RE) generation in Namibia, a license must be issued to an RE producer, and then a PPA has to be negotiated with NamPower acting as the single buyer and grid operator. The ECB has issued several licenses for RE generation to interested independent power producers (IPP). As of 2012, the ECB had issued licenses for 44 MW of RE generation capacity, and has received an estimated 886 MW of new solar license applications.¹⁴ To date, we believe a single, small PV unit has been commissioned.



Figure 3: NamPower Transmission Assets
Source: NamPower Annual Report 2014

The transmission system is owned and managed by NamPower which is the single buyer in Namibia. NamPower has had a history of successful transmission, and prides itself on being "known for innovation, customer focus, and proactive management"¹⁵. NamPower has a number of capital improvements outlined in its Transmission Master Plan 2012, the more near term projects focus on strengthening and upgrading current lines. There has been little growth in the number of transmission and distribution lines in NamPower's network since 2011.

⁹ <http://www.irena.org/DocumentDownloads/events/2013/October/IRP%20NAMIBIA%20Muyambo%2020130927.pdf>

¹⁰ http://www.ecb.org.na/download.php?fl_id=119

¹¹ <http://allafrica.com/stories/201506010344.html>

¹² <http://www.reegle.info/policy-and-regulatory-overviews/NA>

¹³ http://www.ecb.org.na/download.php?fl_id=119

¹⁴ <http://www.irena.org/DocumentDownloads/events/2013/October/IRP%20NAMIBIA%20Muyambo%2020130927.pdf>

¹⁵ <http://www.nampower.com.na/public/docs/annual-reports/NamPower%20Annual%20Report%202014.pdf>

Power distribution is carried out by a number of different entities. This includes several larger Regional Electricity Distributors (REDs) that were formed by the merging of services of multiple smaller electricity distributors from various municipalities and town councils. These individual institutions are now shareholders in the REDs. As the country's capital city, the City of Windhoek Municipality manages the largest amount of electricity distribution. The next largest portion of distribution is operated by the three regional REDs, namely Northern RED (covering the northern areas of the country), Erongo RED (covering the central coastal region), and CENORED (covering the area between Erongo RED and Northern RED). Of the three distribution companies, CENORED appears to suffer the most difficulty meeting benchmarks, and its operations are characterized by higher energy losses (of 15%¹⁶) and lower efficiencies than its peers. Two other REDs have been proposed and have been licensed, but there have been difficulties converting local distribution to REDs. The remaining distribution (largely outside of the REDs' geographic coverage) is fragmented and managed by smaller municipalities, village authorities, farmer schemes, NamPower, and smaller companies including the South African owned Southern Electricity Company¹⁷.

New Energy Sector Projects

Generation

NamPower is developing the 800 MW Combined Cycle Gas Turbine (CCGT) Kudu Power Station. If the Kudu Power Station can be commissioned, it will be the first CCGT power station in Southern Africa of that magnitude, and will be the single largest project in Namibia to date¹⁸. The project would represent a significant increase in Namibia's power generation composition, and as a result has led to the utility stating a lack of interest in long term power purchase agreements due to the anticipated oversupply the Kudu project will provide in the region.¹⁹

The Van Eck power station is undergoing a rehabilitation to bring the high operational costs of the old power plant down, and bringing 90MW of base load into the Namibian power sector. 30MW have already been rehabilitated at the plant, and the remainder of the plant rehabilitation should finish in late 2015, bringing an additional 90MW online.²⁰ Also as an upgrade to current capacity, the Ruacana hydro power station is undergoing an increase in capacity to 347MW.²¹

There are a significant number of smaller, renewable projects at varying stages of development, the largest component of which being a wind farm, in the south west of the country. Diaz Power is the developer, and is expected to begin commercial operation after signing a conditional license for a 44 MW development.²² ²³ Additionally, there is a smaller 20-30 MW solar plant passing through the approval process, being developed by Greenam. This project has faced delays for various reasons.²⁴ Both projects are designed to operate as IPPs.

Electricity Market/Tariff Structure

The average electricity tariff in Namibia is between \$0.086/kWh – \$0.102/kWh. Tariffs for generation, transmission and distribution in Namibia are determined separately.

¹⁶ <http://www.ecb.org.na/wp-content/uploads/2013/11/ECB-Annual-Report-2013.pdf>

¹⁷ <http://www.ecb.org.na/wp-content/uploads/2013/11/ECB-Annual-Report-2013.pdf>

¹⁸

<http://www.nampower.com.na/public/docs/kudu/KP%20Macro%20Economic%20%20Study%20final%2025%20July%202011.pdf>

¹⁹ <http://allafrica.com/stories/201505071117.html>

²⁰ <http://allafrica.com/stories/201506010344.html>

²¹ <http://www.nampower.com.na/Page.aspx?p=185>

²² <http://observer24.com.na/business/2137-namibia-to-utilise-wind-energy>

²³ http://www.ecb.org.na/download.php?fl_id=119

²⁴ <http://www.informante.web.na/ruacana-helps-struggling-nampower.13847>

Tariffs for generation in Namibia are determined using a “cost plus” methodology. The approach adds the revenue requirement of a utility plus a regulated return. All allowable costs of the utilities to cover the cost of supply including primary energy, energy imports, bulk electricity purchases, operating and maintenance costs, overheads, asset-related costs, and investment costs, are included in the utility’s revenue requirement. Namibia imports over 60% of its electricity requirements, at a higher cost than bulk local supply. Therefore the end-user tariff is substantially determined by imports, the cost of which the ECB has no influence over until NamPower submits a request for tariff adjustments.

Transmission and distribution tariffs are not determined through cost reflective tariffs, but through a revenue-requirement method as a mechanism in order to phase in cost reflective tariffs. The utility has also begun the development of a grid code for the Namibian electricity industry to identify technical requirements for connection to the electricity grid by third parties such as IPPs and independent distribution entities.²⁵

In addition to generation tariffs, Namibia has instituted Local Authority Surcharges, which are transmission tariffs established to provide financial support to Local Authorities and Regional Councils after the two groups passed the electricity supply function to the newly formed REDs. The Local Authority Surcharge is a fixed dollar amount per year that is added to the electricity tariffs and collected by the REDs on behalf of the relevant Local Authorities and Regional Councils.

The ECB embarked on a project to develop REFITs for all renewable energy technologies in 2011 which will soon open up the process to IPPs, utilities and other government departments. The REFIT program is establishing the rationale for an appropriate cost-plus-return structure for RE developments that will adequately incentivize the private sector to develop these resources. Additionally, some select projects are being used to test the Model Transaction with appropriate Model PPA and associated regulations.²⁶ The REFIT program’s message to the private developers is “if you build it, we are obligated to buy it at the pre-determined price”.²⁷ Below are the proposed REFIT tariffs:

Type	MW													
	0.5		0.75		1		2		3		4		5	
Biomass	\$	0.19	\$	0.18	\$	0.17	\$	0.15	\$	0.13	\$	0.12	\$	0.11
Wind	\$	0.17	\$	0.16	\$	0.14	\$	0.13	\$	0.12	\$	0.11	\$	0.11
Solar	\$	0.29	\$	0.28	\$	0.28	\$	0.26	\$	0.24	\$	0.23	\$	0.23

Table 2: REFIT Tariff Proposal²⁸

Namibia Utility Financial and Operational Position

NamPower has been performing strongly over the past few years despite the challenges the company faces with increasing reliance on imports, record high peak demand, and increasing direct cost of supply relative to allowable increases in its selling price. NamPower is pushing for cost reflective tariffs, but it is required to petition the ECB to increase tariffs to cover the financial obligations of providing service. In the coming FY 2015/16, the ECB raised tariffs by 72% of NamPower’s request, citing long term goals to keep down the cost of living and economic production in Namibia.²⁹ As such, the lower tariff may result in negative free cash flow at NamPower, and an increase in debt in FY16.³⁰ In the period of 2013 to 2014, NamPower’s sales remained flat, largely attributed to efficiencies implemented in the mining sector as well as increased adoption of distributed solar in areas that they provide power. Revenue increased over the same period, but the gross margin decreased from 50%

²⁵ PMRC ENERGY SERIES: PROMOTING ENERGY INVESTMENT THROUGH COST REFLECTIVE TARIFFS 2014

²⁶ RENEWABLE ENERGY FEED-IN TARIFF (REFIT) FOR NAMIBIA (2014)

²⁷ <http://www.ecb.org.na/wp-content/uploads/2014/04/Namibia-Draft-REFIT-Rules-APRIL-2014.pdf>

²⁸ <http://www.ecb.org.na/wp-content/uploads/2014/04/Namibia-Draft-REFIT-Rules-APRIL-2014.pdf>

²⁹ <http://allafrica.com/stories/201505071263.html>

³⁰ <http://www.nampower.com.na/public/docs/investor-relations/Fitch%20NamPower%202015%20Report.pdf>

to 46%, illustrating the increasing cost of electricity which rose 48% in 2013 and 30% in 2014.

In terms of transmission, NamPower has a history of strong performance in electricity transmission. The company has set goals to upgrade the entire national transmission network and install over 700 km of new lines, although NamPower has noted they are currently deficient in meeting this goal. This is of particular concern as the company has also outlined goals to increase rural electrification, as well as commission a number IPP solar and wind farms.³¹

NamPower has successful collections and limits its credit risk successfully. The vast majority of the utility's credit risk in supplying electricity rests with the REDs (63%) and mining companies (23%), leaving very little risk on end use customers. Trade and other receivables over 30 days overdue are reported at less than 1%³².

Namibia and Regional Interconnection

Namibia's participation in the regional power market is also through NamPower. NamPower has long participated in regional power transactions in order to diversify sources of supply, and keep tariffs low. NamPower is the only entity that can trade regional power in the country.

NamPower has long had bilateral contracts with a number of utilities in the SADC region, particularly ESKOM of South Africa. During the dry season, the utility imports around 80% of its power requirements from the surrounding countries. Most recently, NamPower signed a new 15 year 80 MW PPA with the Zimbabwe Power Company to replace an initial PPA signed in 2006. Under the old agreements, NamPower and the Zimbabwean utility would rehabilitate the Hwange Power Station in Zimbabwe. NamPower procured USD40 million in funds and in return, ZESA was to provide 150 MW³³ of power to Namibia for 8 years.

The partners developing the Kudu Gas Power Plant include NamPower with the majority ownership, as well as CEC Africa, a wholly owned subsidiary of CEC, the Zambia based power transmission and distribution company. NamPower will sign a PPA with Kudu Power and will be the off-taker of all the power from the Kudu Power Station³⁴. Of the 800 MW produced by Kudu Power, 400 MW will be for consumption in Namibia and 300 MW will be sold to CEC through a Power Export Agreement (PXA) and the remaining 100 MW is expected to be exported to South Africa through a similar PXA arrangement. The table below shows NamPower's regional trading partners³⁵.

Utility	Agreement	Duration	Capacity
Eskom (South Africa)	Supplementary Power Supply (PS) Agreement	Year on Year	Up to 200 MW (interruptible)
Eskom (South Africa)	Bilateral PS Agreement	10 Years (Signed 2006, expires 2016)	Up to 300 MW (Mainly Off Peak)
ZESA (Zimbabwe)	Power Supply Agreement	15 Years (Effective April 2015)	80 MW (Firm)
ZESCO (Zambia)	Power Purchase Agreement	10 years (Signed 2009, Expires 2019)	50MW (Firm)

³¹ <http://www.nampower.com.na/public/docs/annual-reports/NamPower%20Annual%20Report%202014.pdf>

³² <http://www.nampower.com.na/public/docs/annual-reports/NamPower%20Annual%20Report%202014.pdf>

³³ <http://constructioninsightmagazine.com/electricity-in-short-supply-and-expensive-nampower-nd/>

³⁴ <http://www.nampower.com.na/public/docs/kudu/Kudu%20Power%20Project%20-%20Update%20Presentation%20-%20September%202014.pdf>

³⁵ NamPower Electricity Supply Update, www.nampower.com.na

Utility	Agreement	Duration	Capacity
Aggreko (Mozambique)	Power Purchase Agreement (Profiled Firm Supply)	2.5 Years with Option to Extend (Effective June 2013)	90 MW (Mid Merit)

Table 3: NamPower's Regional Trading Partners

Cross Border Transmission Lines

As mentioned above, Namibia imports approximately 80% of its power from surrounding countries during the dry season. Additionally, because of the deal with the Zimbabwean utility, NamPower imports approximately 30% of its power from Zimbabwe alone. Several existing and planned cross border transmission lines will enable the import of power, and once Kudu is complete, the export of power from Namibia to South Africa and Zambia.

The Caprivi Interconnect is the only major transmission network development between north and west SAPP in the last 15 years³⁶. The project consisted of the construction of a 200 MW (upgradeable to 600 MW) HVDC transmission connection from Zambia to the Namibian electricity network, interconnecting the northern and western parts of the SAPP network. The line reinforces the electricity transmission interconnection between Zambia, Namibia and South Africa and provides a reliable route for electricity exports and imports while supporting a competitive regional power market. The 970 km new transmission line starts in the north-eastern tip of Namibia and ends in central Namibia³⁷.

The highest priority project connecting to Namibia is the ZIZABONA regional interconnect which will connect and reinforce the power systems of Zimbabwe-Zambia-Botswana-Namibia. The ZIZABONA project will allow these four countries to export and import more power and trade with each other and with the wider SAPP area³⁸.

Another priority project is the Kudu Transmission Integration project. Project planning and preparation is at an advanced stage and will integrate the Kudu Transmission station into the NamPower Transmission Network and the Eskom transmission network. The project is anticipated to include two 400 kV feeders to the Eskom network and a 400kV feeder to the NamPower network as well as other deep connection upgrades to the NamPower network, depending on executed PPAs.

LOSS REDUCTION

Namibia Loss Reduction Strategy

Currently, NamPower does not issue any publications on loss reduction initiatives, or discuss technical and non-technical losses as an issue in Namibia. Electricity losses in the country have been reported as some of the lowest among all African countries of around 18-19%³⁹. NamPower prides itself on its transmission infrastructure, as well as its operational efficiency in transmission. Although there are differing views of NamPower's performance in controlling commercial losses, NamPower does not appear to have any formal revenue management strategy nor does it currently run any programs geared specifically towards loss reduction, as far as we have been able to ascertain. Current activities intended to reduce loss reduction are conducted by the local authorities, and designed to deter thieves from such activities.

Current Loss Landscape

Losses do appear to be a serious detriment to NamPower's financial sustainability, as the organization which provides its credit rating anticipates losses (assumedly technical and

³⁶ Project Completion Report, EU-Africa Infrastructure Trust Fund

³⁷ <http://www.eu-africa-infrastructure-tf.net/activities/grants/caprivi-interconnector.htm>

³⁸ http://www.sapp.co.zw/docs/120712_ZIZABONA%20Presentation%20to%20IRT_Final.pdf

³⁹ www.esmap.org/sites/esmap.org/files/P099234_AFR_Monitoring%20Performance%20of%20Electric%20Utilities_Tallapragada_0.pdf

commercial) in the range of 25% for 2015.⁴⁰ This is a lot higher than the 14.4% reported by NamPower in 2014, and when taken in combination with 2013 losses reported at 9.7%, it indicates a sharp decrease in NamPower's performance, and possibly also increasing deficiency in their transmission and distribution infrastructure. This issue is not discussed further within NamPower's Annual Report.⁴¹ Specific theft data is largely unavailable to the public, as far as we have been able to establish.

Revenue management concerns are also an issue for distributors and large municipalities. When power is stolen from the distribution grid, the cost of the stolen electricity must still be paid to NamPower, which puts significant financial burden on the distributors. There are few programs in place to address the concerns of non-technical loss reduction, and distributors condemn the practice of stealing electricity by means of illegal connections to the power grid. Offenders are generally penalized with a fine and the illegal electricity connections are cut off. Up to 30 offenders with illegal electricity connections are caught per month in Windhoek (the country's largest city and most densely populated area) alone, although illegal connections are often reestablished the day they are removed. Fines are settled with the authorities⁴². Additionally, Erongo RED has begun a campaign to reduce electricity theft, citing its dangers to those who try to make an illegal connection while providing a hotline for those wishing to report theft or vandalism.⁴³

Like its fellow utilities expanding their transmission and distribution assets in the region, NamPower is facing significant pressure from thieves dismantling their infrastructure for scrap copper and other metals. In 2013, 400 cross braces were stolen from around NamPower's network leading to the collapse of a 132kV power line, interrupting power for two weeks to the city of Rundu (Pop. 63,431). NamPower has estimated the costs of stolen braces to be in the millions of dollars, but precise numbers are hard to determine as the affected area is geographically disperse. Local law enforcement have been ineffective in stopping the theft, but have offered a return policy for any stolen materials without penalty.⁴⁴

With regards to technical losses, NamPower has struggled with the colonization of a local bird, the Social Weaver, and its role in technical losses in utility structures for over 100 years. Its nesting behavior inevitably results in the short circuiting of transmission lines. A project in partnership with the Namibia Nature Foundation has thus far been unsuccessful in preventing the effects of the Social Weaver⁴⁵.

Namibian Loss Reduction Programs

Erongo RED, CENORED, & the City of Windhoek

Erongo RED is currently working on upgrading and adapting their metering systems. The focus of the plan is to install meters which check themselves, as well as retrofit meters to prevent identified tampering problems. Erongo RED has also begun to encourage non-paying conventional customers to convert to prepayment in order to protect revenue. Erongo RED would like to restore the accounts of those with outstanding balances, and see prepayment as a way to continue service, while debtors pay off their account⁴⁶. CENORED and the City of Windhoek have similar programs encouraging customers to purchase prepaid meters. In fact, both entities have developed technology that allows customers to prepay their electricity from their cell phone.⁴⁷

⁴⁰ <http://allafrica.com/stories/201501270534.html>

⁴¹ http://www.ecb.org.na/download.php?fl_id=119

⁴² <http://www.namibiansun.com/local-news/electricity-theft-costs-city.62071>

⁴³ http://www.erongored.com/wp-content/uploads/2013/11/2013-2014_Tariff_Booklet.pdf

⁴⁴ <http://www.nampower.com.na/public/docs/wattson/WattsOn-NL%203rd%20Edition%202013.pdf>

⁴⁵ <http://www.nampower.com.na/public/docs/wattson/401-NamPower%20Corp-Watts%20On%20Newsletter%202014%20edition.pdf>

⁴⁶ <http://www.erongored.com/>

⁴⁷ <http://www.economist.com.na/markets/2933-reds-sell-prepaid>

Review

Strengths

NamPower is **strong financially, and well respected** in the region. With its largely transparent discussion of its operations and significant engagement with the private sector on a variety of projects, NamPower is far better positioned to engage the private sector than many Southern African utilities in future loss reduction efforts.

Erongo RED, CENORED, & the City of Windhoek distribution entities have worked successfully to drive customers towards prepayment options, as well as make the power system convenient for the modern age.

Improvement Areas

While there is anecdotal evidence of illegal connections and infrastructure vandalism, the REDs have not provided significant public information on non-technical loss statistics, nor are there many active programs to prevent such activities. Additionally, little information is available on smaller distribution entities, such as smaller municipalities, village authorities, and farmer schemes. As these entities are distributing to more remote and sparsely populated areas, more transparent data collection would provide more actionable findings.

Due to conflicting reports by reputable sources, it is **difficult to determine the extent of transmission losses** for NamPower. Vandalism is certainly an issue for the entity, but the exact numbers are left vague. Transmission losses are provided in NamPower's most recent annual report, but they are roughly 60% the anticipated loss amount for the subsequent fiscal year.

SOURCES

USAID Country page

DOS Country page

World Bank country programs

IFC country programs

Utility company websites – investor decks

EIA

Legal reviews

Local government agency websites